

PATENT ABSTRACTS OF JAPAN

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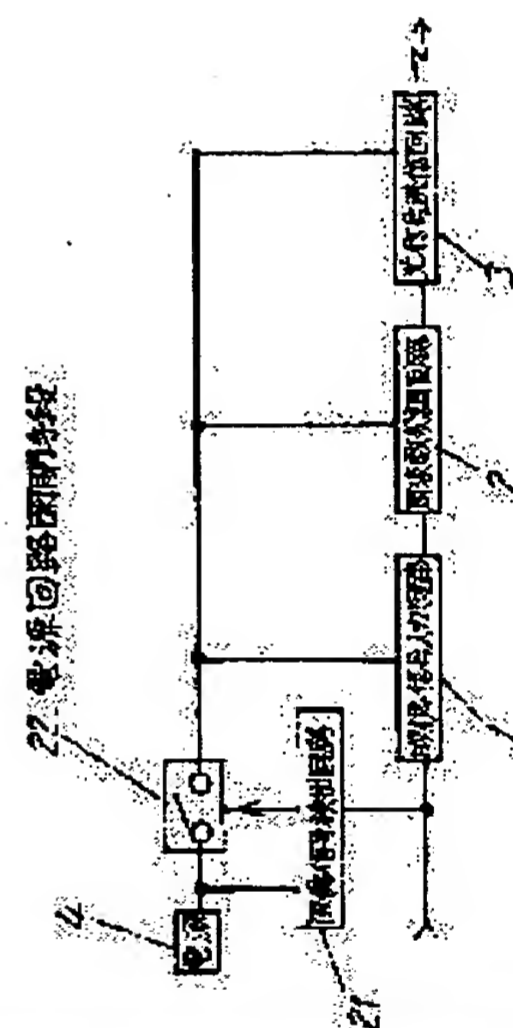
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(54) OPTICAL SIGNAL TRANSMITTER

(57)Abstract:

PROBLEM TO BE SOLVED: To eliminate the complication that a power supply circuit is switched by manual operation and to suppress the waste of electric power and the reduction of the life of a light emitting part with respect to an optical signal transmitter which converts a video signal or the like to an optical signal to transmit it to a receiver.

SOLUTION: Only when the video signal is inputted, a power supply circuit switching means 22 is automatically closed by a video signal direction circuit 21 to which power is supplied from a power source 4 during the use, and power is supplied to a video signal input circuit 1, a frequency modulation circuit 2, and an optical signal transmission circuit 3 consuming relatively large electric power to operate these circuits. Thus, the optical signal transmitter that the complication that the power supply circuit is switched by manual operation is eliminated and the waste of electric power and the reduction of the life of the light emitting part are suppressed is obtained.



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CLAIMS

[Claim(s)]

[Claim 1] The video-signal detector which energizes [be / it / under / use / letting it pass], and detects the existence of a video-signal input, The power circuit closing motion means by which closing motion control is carried out with the output signal of this video-signal detector, The video-signal input circuit which is connected to the load side of this power circuit closing motion means, and clamps a video-signal input by the predetermined reference voltage level, The lightwave signal transmitter which consists of a frequency modulation circuit which is connected to the load side of the above-mentioned power circuit closing motion means, and carries out the frequency modulation of the output of the above-mentioned video-signal input circuit, and a lightwave signal sending circuit which is connected to the load side of the above-mentioned power circuit closing motion means, changes the output of the above-mentioned frequency modulation circuit into a lightwave signal, and floodlights it.

[Claim 2] The lightwave signal transmitter according to claim 1 which has the synchronizing signal extract circuit which extracts the synchronizing signal with which the video-signal detector was included in the video signal, and is controlled to control to make a power circuit closing motion means close when it integrates with the extracted synchronizing signal and a predetermined voltage level is reached, and to make a power circuit closing motion means open when the time amount extract of predetermined is not carried out for a synchronizing signal.

[Claim 3] The lightwave signal transmitter according to claim 1 or 2 with which it is used at least, supplying other power sources and signal outputs of electronic equipment.

[Claim 4] The lightwave signal transmitter according to claim 3 with which a power circuit closing motion means serves as close at the time of the signal with which the closing motion control signal outputted from other electronic equipment makes a power circuit closing motion means close while a video-signal input is detected by the video-signal detector.

[Claim 5] The lightwave signal transmitter according to claim 3 or 4 which prepared the circuit changing switch which chooses both or the power circuit closing motion means of the closing motion control signal outputted in the closing motion control signal of a power circuit closing motion means from the electronic equipment of the output signal of a video-signal detector and others as either of the signals changed into a normally open condition. [output signal / of a video-signal detector]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the lightwave signal transmitter which transmits the video signal reproduced with the video camera etc. to TV receiver etc.

[0002]

[Description of the Prior Art] The conventional lightwave signal transmitter is explained using a drawing.

[0003] The video-signal input circuit which drawing 4 is the block diagram of the conventional lightwave signal transmitter, and clamps the video signal into which 1 is inputted from the outside to a predetermined reference voltage level in this drawing, The frequency modulation circuit where 2 carries out the frequency modulation of the output of the video-signal input circuit 1, the lightwave signal sending circuit which 3 changes into a lightwave signal the modulating signal which is the output of the frequency modulation circuit 2, and is floodlighted, and 4 are the power sources which used the cell etc. 5 is a power circuit closing motion means to connect between this power source 4, said video-signal input circuit 1, the frequency modulation circuit 2, and the lightwave signal sending circuit 3, and to perform **** of a power circuit by manual operation.

[0004] And drawing 5 is an example of the circuit diagram of said lightwave signal sending circuit 3, and when the power circuit is connected with LED6 as a light-emitting part, a transistor 7, emitter resistance 8, and the capacitor 9 connected to the base of a transistor 7, it is constituted by the base resistance 10 and 11 which gives a predetermined DC bias to the base of a transistor 7, and makes a transistor 7 an ON state.

[0005] Thus, if actuation of the constituted lightwave signal transmitter is explained, the video signal inputted from the outside will be clamped by the voltage level predetermined at the bottom (henceforth sink level) of a signal wave form by the video-signal input circuit 1, and will be changed into the amplitude suitable for the input of the frequency modulation circuit 2.

[0006] And the output of the video-signal input circuit 1 is inputted into the frequency modulation circuit 2. Frequency modulation is carried out so that the White 100% level whose sink level is the summit of 11.5MHz and a signal wave form may be set to 13.5MHz according to EIAJ standards. The modulating signal is inputted into the lightwave signal sending circuit 3, the lightwave signal sending circuit 3 changes the collector current of a transistor 7 according to the level of a modulating signal, the change turns into change of light by LED6, and an electrical signal is changed into a lightwave signal and floodlighted.

[0007]

[Problem(s) to be Solved by the Invention] However, in the above-mentioned conventional lightwave signal transmitter, when a video signal tends to be changed into a lightwave signal and it is going to transmit, in order to supply power to the video-signal input circuit 1, the frequency modulation circuit 2, and the lightwave signal sending circuit 3 first, when it is necessary to close the power circuit closing motion means 5 by manual operation and and transmission of a lightwave signal is suspended, the power circuit closing motion means 5 is opened by manual operation, and it has composition which stops current supply.

[0008] For this reason, although the power circuit closing motion means 5 can also be closed through while using the lightwave signal transmitter in the conventional lightwave signal transmitter in order for there to be complicatedness which opens and closes the power circuit closing motion means 5 by manual operation whenever it transmits and stops a video signal with a lightwave signal and to remove this complicatedness Also while there are no video-signal inputs, such as the time of a halt of video-

signal playback by electronic equipment, rewinding [of a record medium], and exchange, the video-signal input circuit 1, the frequency modulation circuit 2, and the lightwave signal sending circuit 3 consume power. Moreover, since LED6 is always continuing emitting light, it had the technical problem that the life of LED6 will be shortened.

[0009] This invention aims at realizing the lightwave signal transmitter which suppresses waste of power, and compaction of the life of a light-emitting part while it operates the circuit after a video-signal input circuit automatically and loses the complicatedness of closing motion of the power circuit closing motion means by manual operation, only when such a conventional technical problem is solved and a video signal is inputted.

[0010]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem the lightwave signal transmitter of this invention The video-signal detector which a power source is always supplied and detects the existence of a video-signal input, The power circuit closing motion means by which closing motion control is carried out with the output signal of this video-signal detector, Connect with the load side of this power circuit closing motion means, and it connects with the load side of the video-signal input circuit which clamps a video-signal input circuit by the predetermined reference voltage level, and the above-mentioned power circuit closing motion means. The frequency modulation circuit which carries out the frequency modulation of the output of the above-mentioned video-signal input circuit, and the lightwave signal sending circuit which is connected to the load side of the above-mentioned power-source closing motion means, changes the output of the above-mentioned frequency modulation circuit into a lightwave signal, and floodlights it are prepared.

[0011] Thereby, only when a video signal is inputted, power can be made to be able to supply to the circuit after a video-signal input circuit automatically, the complicatedness of the power circuit closing motion means closing motion by manual operation can be lost, and the lightwave signal transmitter which suppresses waste of power and compaction of a light-emitting part life can be obtained.

[0012]

[Embodiment of the Invention] The video-signal detector which energizes [be / it / under / use / letting it pass] invention of this invention according to claim 1, and detects the existence of a video-signal input, The power circuit closing motion means by which closing motion control is carried out with the output signal of this video-signal detector, The video-signal input circuit which is connected to the load side of this power circuit closing motion means, and clamps a video-signal input by the predetermined reference voltage level, The frequency modulation circuit which is connected to the load side of the above-mentioned power circuit closing motion means, and carries out the frequency modulation of the output of the above-mentioned video-signal input circuit, Connect with the load side of the above-mentioned power circuit closing motion means, and it considers as the lightwave signal transmitter which consists of a lightwave signal sending circuit which changes the output of the above-mentioned frequency modulation circuit into a lightwave signal, and floodlights it. Only when a video signal is inputted, it is automatically controlled so that a power circuit closing motion means serves as close. A power source can be made to be able to supply to the circuit after a video-signal input circuit, it can be made to operate, the complicatedness of the power circuit closing motion means closing motion by manual operation is lost, and it has an operation that the lightwave signal transmitter which suppresses waste of power and compaction of a light-emitting part life is realizable.

[0013] Invention according to claim 2 is set to invention according to claim 1. A video-signal detector It controls to make a power circuit closing motion means close, when it has the synchronizing signal extract circuit which extracts the synchronizing signal contained in the video signal, it integrates with the extracted synchronizing signal and a predetermined voltage level is reached. It is what is controlled so that a synchronizing signal makes a power circuit closing motion means open, when the time amount extract of predetermined is not carried out. The existence of a video signal can be detected using the synchronizing signal by which the period and the voltage level were stabilized, and it has an operation

that the lightwave signal transmitter which can carry out closing motion control of the power circuit closing motion means certainly is realizable.

[0014] In invention according to claim 1 or 2, it is used at least, supplying other power sources and signal outputs of electronic equipment, and invention according to claim 3 changes into a lightwave signal the video signal outputted from other electronic equipment, and has an operation that it can transmit to still more nearly another electronic equipment.

[0015] In invention according to claim 3, while a video-signal input is detected by the image detector, invention according to claim 4 It is that from which a power circuit closing motion means serves as close at the time of the signal with which the closing motion control signal outputted from other electronic equipment makes a power circuit closing motion means close. When the video signal is inputted, it has an operation that closing motion control of the power circuit closing motion means can be automatically carried out with the closing motion control signal outputted by the use existence of the predetermined function of other electronic equipment.

[0016] Invention according to claim 5 is set to invention according to claim 3 or 4. The closing motion control signal of a power circuit closing motion means only the output signal of a signal detector Both the output signal of a signal detector, and the closing motion control signal outputted from other electronic equipment Or the circuit changing switch which chooses a power circuit closing motion means as either of the signals changed into a normally open condition is prepared. It has an operation that selection according to an application which performs closing motion control of a power circuit closing motion means only by the existence of a video-signal input, carries out with both closing motion control signals from the existence of a video-signal input and other electronic equipment, or makes a power circuit closing motion means normally open can be performed.

[0017] Hereafter, the gestalt of operation of this invention is explained using a drawing. In addition, the same sign is given to the part of the same configuration as the configuration explained by the term of a Prior art, and detailed explanation is omitted.

[0018] Drawing 1 is the block diagram of the lightwave signal transmitter by the gestalt of operation of the 1st of this invention, and is set to this drawing. (Gestalt 1 of operation) The video-signal input circuit which clamps the video signal into which 1 is inputted from the outside to a predetermined reference voltage level, The frequency modulation circuit where 2 carries out the frequency modulation of the output of the video-signal input circuit 1, the lightwave signal sending circuit which 3 changes into a lightwave signal the modulating signal which is the output of the frequency modulation circuit 2, and is floodlighted, 4 is the power source which used the cell etc., and since the same is said of those actuation, these omit detailed explanation, while being constituted like what was explained by the term of a Prior art.

[0019] And 21 is the video-signal detector to which it connects with a power source 4 and firm power is supplied. The closing motion control signal corresponding to each of the existence of the video-signal input from the outside is outputted, and 22 is the power circuit closing motion means which consisted of relays etc. One of these is connected to the above-mentioned power source 4, and another side which is a load side is connected to juxtaposition at each of the above-mentioned video-signal input circuit 1, the frequency modulation circuit 2, and the lightwave signal sending circuit 3. When controlled to become close with the closing motion control signal from the above-mentioned video-signal detector 21, the power from the above-mentioned power source 4 is supplied to the above-mentioned video-signal input circuit 1, the frequency modulation circuit 2, and the lightwave signal sending circuit 3.

[0020] Furthermore, the above-mentioned video-signal detector 21 is constituted as shown in the outline block diagram of drawing 2. The synchronizing signal extract circuit which extracts a synchronizing signal from the video signal into which 23 was inputted in this drawing, The reversal buffer circuit which 24 reverses the extracted synchronizing signal and obtains binary [of supply voltage level or a grand level] as an output level, and 25 are the integrators constituted by two resistance 26 and 27 and one capacitor 28, in order to integrate with the output of the reversal buffer circuit 24.

[0021] Next, if actuation of such a video-signal detector 21 is explained, when the video signal of NTSC system is inputted, a synchronizing signal extract circuit will be set up so that the Horizontal Synchronizing signal which exists the fixed period of 15kHz in a video signal may be extracted, and the reversal buffer circuit 24 will output the signal of the binary square wave form of supply voltage level and a grand level with the period corresponding to the extracted synchronizing signal, for example.

[0022] And an integrator 25 integrates with the signal of this square wave form, and a capacitor 28 is charged. When the electrical potential difference of the both ends, i.e., the output voltage of an integrator 25, is set to predetermined level, When the power circuit closing motion means 22 was made close, a video-signal input stops, the charge of a capacitor 28 discharges through resistance 27 and the electrical potential difference of the both ends of a capacitor 28 falls rather than predetermined level, a closing motion control signal which makes open the power circuit closing motion means 22 is outputted.

[0023] Thus, while the existence detection with a high precision is obtained by using for detection of the existence of a video-signal input the synchronizing signal by which the voltage level of a fixed period was stabilized It is easy to change the extracted synchronizing signal into the stable wave-like square wave. By setting up the time constant made to discharge when a capacitor 28 is charged with the signal of this square wave and there is no video-signal input by resistance 26 and 27 and selection of the value of a capacitor 28 Time amount after a video signal is inputted until it makes close the power circuit closing motion means 22, And time amount after a video-signal input is suspended until it makes open the power circuit closing motion means 22 can be set up appropriately. Even if there are an input of an instant-noise and lack of an instant-[again] video signal or a synchronizing signal, it is stabilized and the power circuit closing motion means 22 can be maintained at an open or close condition.

[0024] Furthermore, a buffer circuit (not shown) is prepared between the output side of an integrator 25, and the power circuit closing motion means 22, and by having stabilized further the closing motion control signal of the power circuit closing motion means 22, when the polarity of closing motion control of the power circuit closing motion means 22 is the above, and when reverse, a reversal buffer circuit (not shown) can be prepared and it can also respond.

[0025] Only when a video signal is inputted as mentioned above according to the gestalt of this operation, the power circuit closing motion means 22 is automatically made close. Since the power circuit closing motion means 22 is automatically made open when power is supplied to the video-signal input circuit 1 which consumes many of power, the frequency modulation circuit 2, and the lightwave signal sending circuit 3 and a video-signal input stops The complicatedness by the manual operation of the power circuit closing motion means 22 can be lost, and the lightwave signal transmitter which suppresses waste of power and the life-shortening of LED can be obtained.

[0026] In addition, although the gestalt of the above-mentioned implementation explained the lightwave signal transmitter which changes a video signal into a lightwave signal and is transmitted, of course, the effectiveness same also as what changes into a lightwave signal a sound signal, a digital signal, and the signal that compounded those signals, and transmits can be acquired.

[0027] (Gestalt 2 of operation) Drawing 3 is the outline block diagram of the lightwave signal transmitter combined with the video camera by the gestalt of operation of the 2nd of this invention, in this drawing, 31 is a lightwave signal transmitter and the video camera with which the side face of a body was equipped with the LCD display 33 with 32 [comparatively large-sized], and the power source 34 by the side of a video camera 32, the video-signal output section 35, and the signal output part 36 accompanying use and un-using it are connected to the lightwave signal transmitter 31, respectively. [of the LCD display 33]

[0028] And in the lightwave signal transmitter 31, AND circuit 38 which takes the AND of the closing motion control signal which is an output from the video-signal detector 37, and the signal which is not used [use and], and the mode circuit changing switch 40 which can change the control state of the power circuit closing motion means 39 of the lightwave signal transmitter 31 at the output side according to an application are formed. [of the LCD display 33]

[0029] Below, it is combined with a video camera 32 as mentioned above, and actuation of the constituted lightwave signal transmitter 31 is explained.

[0030] First, when the mode circuit changing switch 40 is set as A mode Only the closing motion control signal from the video-signal detector 37 comes to be inputted into the power circuit closing motion means 39 through the mode circuit changing switch 40. When the lightwave signal transmitter 31 operates only when a video signal is inputted, and the mode circuit changing switch 40 is set as the B mode While the output of AND circuit 38 which takes the AND of the closing motion control signal from the video-signal detector 37 and the signal from the signal output part 36 which is not used [use and] comes to be inputted into the power circuit closing motion means 39 through the mode circuit changing switch 40 and a video signal is inputted, [of the LCD display 33] It is that to which the AND output by AND circuit 38 makes close the power circuit closing motion means 39 only at the time of un-using [of the LCD display 33] it, and the lightwave signal transmitter 31 operates. When the mode circuit changing switch 40 is set as the C mode, the input to the power circuit closing motion means 39 through the mode circuit changing switch 40 is always a grand level, and even if a video signal is inputted into the lightwave signal transmitter 31, the lightwave signal transmitter 31 does not operate.

[0031] When the mode circuit changing switch 40 is set as A mode as mentioned above according to the gestalt of this operation If a video signal is inputted into the lightwave signal transmitter 31, while the power circuit closing motion means 39 will serve as close automatically, and a video signal will be changed into a lightwave signal with the lightwave signal transmitter 31 and being transmitted to TV receiver (not shown) which is a receiving side When an image can be displayed and the mode circuit changing switch 40 is set as the B mode also by the LCD display 33 with which the video camera 32 was equipped when required While a video signal is inputted into the lightwave signal transmitter 31, at the time of un-using [of the LCD display 33] it, the power circuit closing motion means 39 serves as close automatically, and a lightwave signal is transmitted to TV receiver. It is what the power circuit closing motion means 39 serves as open automatically, and suppresses the waste of power and the compaction of a light-emitting part life by the lightwave signal transmitter 31 when using the LCD display 33. In connecting between TV receivers with a video camera 32 by another cable (not shown) etc. and transmitting a video signal The mode circuit changing switch 40 is set as a C mode, and the usage according to the application of the lightwave signal transmitter 31 can be easily chosen by setup of the mode circuit changing switch 40 as the lightwave signal transmitter 31 is not operated, even if a video signal is inputted into the lightwave signal transmitter 31.

[0032]

[Effect of the Invention] As mentioned above, according to this invention, except for a video-signal detector, only when a video signal is inputted into the circuit which consumes large power comparatively, power can be made to be able to supply to it automatically, the complicatedness by the manual operation of a power circuit closing motion means can be lost, and the advantageous effectiveness that the lightwave signal transmitter which suppresses waste of power and compaction of a light-emitting part life is realizable can be acquired.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The block diagram of the lightwave signal transmitter by the gestalt of operation of the 1st of this invention

[Drawing 2] The outline block diagram of this video-signal detector

[Drawing 3] The outline block diagram of the lightwave signal transmitter combined with the video camera by the gestalt of operation of the 2nd of this invention

[Drawing 4] The block diagram of the conventional lightwave signal transmitter

[Drawing 5] The circuit diagram of this lightwave signal sending circuit

[Description of Notations]

1 Video-Signal Input Circuit

2 Frequency Modulation Circuit

3 Lightwave Signal Sending Circuit

4 34 Power source

21 37 Video-signal detector

22 39 Power circuit closing motion means

23 Synchronizing Signal Extract Circuit

24 Reversal Buffer Circuit

25 Integrator

26 27 Resistance

28 Capacitor

31 Lightwave Signal Transmitter

32 Video Camera

33 LCD Display

35 Video-Signal Output Section

36 Signal Output Part

38 AND Circuit

40 Mode Circuit Changing Switch

[Translation done.]

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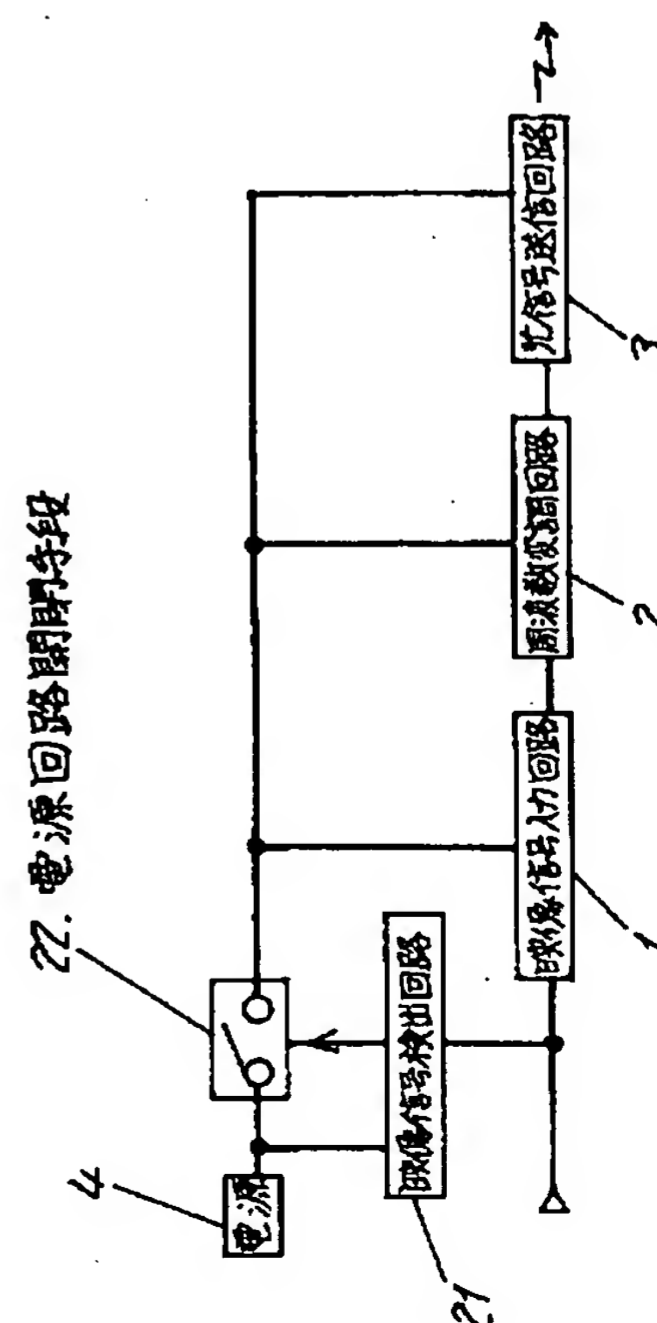
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(54)【発明の名称】 光信号送信機

(57)【要約】

【課題】 映像信号などを光信号に変換して受信機に送信する光信号送信機に関し、手動操作による電源回路開閉の煩雑さをなくすと共に、電力の浪費と発光部寿命の短縮を抑える光信号送信機を実現することを目的とする。

【解決手段】 使用中を通して電源4より通電される映像信号検出回路21により、映像信号が入力された時のみ自動的に電源回路開閉手段22を閉とし、比較的大きな電力を消費する映像信号入力回路1、周波数変調回路2、光信号送信回路3に電力を供給して動作させるもので、手動操作による電源回路開閉の煩雑さをなくし、電力の浪費と発光部寿命の短縮を抑える光信号送信機を得ることができる。



(2)

【特許請求の範囲】

1
【請求項1】 使用中を通して通電され、映像信号入力の有無を検出する映像信号検出回路と、この映像信号検出回路の出力信号により開閉制御される電源回路開閉手段と、この電源回路開閉手段の負荷側に接続され、映像信号入力を所定の基準電圧レベルでクランプする映像信号入力回路と、上記電源回路開閉手段の負荷側に接続され、上記映像信号入力回路の出力を周波数変調する周波数変調回路と、上記電源回路開閉手段の負荷側に接続され、上記周波数変調回路の出力を光信号に変換して投光する光信号送信回路からなる光信号送信機。

【請求項2】 映像信号検出回路が映像信号に含まれた同期信号を抽出する同期信号抽出回路を有し、抽出された同期信号を積分して所定の電圧レベルに達したときに電源回路開閉手段を閉とするように制御し、同期信号が所定の時間抽出されない時に電源回路開閉手段を開とするように制御する請求項1記載の光信号送信機。

【請求項3】 少なくとも他の電子機器の電源と信号出力が供給されて使用される請求項1または2記載の光信号送信機。

【請求項4】 映像信号検出回路により映像信号入力が出検されると共に、他の電子機器から出力される開閉制御信号が電源回路開閉手段を閉にする信号の時、電源回路開閉手段が閉となる請求項3記載の光信号送信機。

【請求項5】 電源回路開閉手段の開閉制御信号を映像信号検出回路の出力信号のみ、映像信号検出回路の出力信号と他の電子機器から出力される開閉制御信号の両方、または電源回路開閉手段を常時開状態にする信号のいずれかに選択する切換えスイッチを設けた請求項3または4記載の光信号送信機。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、ビデオカメラなどで再生された映像信号をTV受信機などに送信する光信号送信機に関するものである。

【0002】

【従来の技術】従来の光信号送信機について、図面を用いて説明する。

【0003】図4は従来の光信号送信機のブロック図であり、同図において、1は外部から入力される映像信号を所定の基準電圧レベルにクランプする映像信号入力回路、2は映像信号入力回路1の出力を周波数変調する周波数変調回路、3は周波数変調回路2の出力である変調信号を光信号に変換して投光する光信号送信回路、4は電池などを用いた電源で、5はこの電源4と前記映像信号入力回路1、周波数変調回路2、および光信号送信回路3の間に接続され、手動操作で電源回路の接断を行う電源回路開閉手段である。

【0004】そして、図5は前記光信号送信回路3の回路図の一例であり、発光部としてのLED6、トランジ

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スタ7、エミッタ抵抗8、およびトランジスタ7のベースに接続されたコンデンサ9と、電源回路が接続されている時にトランジスタ7のベースに所定のDCバイアスを与えてトランジスタ7をオン状態にするベース抵抗10、11により構成されている。

【0005】このように構成された光信号送信機の動作について説明すると、外部から入力された映像信号は映像信号入力回路1により信号波形の最下部（以下シンクレベルという）で所定の電圧レベルにクランプされ、周波数変調回路2の入力に適した振幅に変換される。

【0006】そして、映像信号入力回路1の出力は周波数変調回路2に入力され、EIAJ規格にしたがってシンクレベルが11.5MHz、信号波形の最高部であるホワイト100%レベルが13.5MHzになるように周波数変調され、その変調信号が光信号送信回路3に入力されて光信号送信回路3が変調信号のレベルに応じてトランジスタ7のコレクタ電流を変化させ、その変化がLED6で光の変化となって、電気信号が光信号に変換されて投光される。

20 【0007】

【発明が解決しようとする課題】しかしながら上記従来の光信号送信機においては、映像信号を光信号に変換して送信しようとする場合には、まず映像信号入力回路1、周波数変調回路2、光信号送信回路3へ電力を供給するために電源回路開閉手段5を手動操作で閉じる必要があり、また光信号の送信を停止する時は電源回路開閉手段5を手動操作で開き、電源供給を止める構成になっている。

【0008】このため、従来の光信号送信機では、映像信号を光信号で送信および停止する度に電源回路開閉手段5を手動操作で開閉する煩雑さがあり、またこの煩雑さを除くために、光信号送信機を使用している間を通して電源回路開閉手段5を閉じておくこともできるが、電子機器での映像信号再生の一時停止や、記録媒体の巻き戻し、交換時など映像信号入力がない間も映像信号入力回路1、周波数変調回路2、および光信号送信回路3が電力を消費し、また、LED6は常時発光し続けているためLED6の寿命を短くしてしまうという課題があった。

【0009】本発明は、このような従来の課題を解決するものであり、映像信号が入力されたときのみ、自動的に映像信号入力回路以降の回路を動作させ、手動操作による電源回路開閉手段の開閉の煩雑さをなくすると共に、電力の浪費と発光部の寿命の短縮を抑える光信号送信機を実現することを目的とする。

【0010】

【課題を解決するための手段】上記課題を解決するために本発明の光信号送信機は、常時電源が供給され、映像信号入力の有無を検出する映像信号検出回路と、この映像信号検出回路の出力信号により開閉制御される電源回

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路開閉手段と、この電源回路開閉手段の負荷側に接続され、映像信号入力回路を所定の基準電圧レベルでクランプする映像信号入力回路と上記電源回路開閉手段の負荷側に接続され、上記映像信号入力回路の出力を周波数変調する周波数変調回路と、上記電源開閉手段の負荷側に接続され、上記周波数変調回路の出力を光信号に変換して投光する光信号送信回路を設けたものである。

【0011】これにより、映像信号が入力されたときのみ、映像信号入力回路以降の回路に自動的に電力を供給させ、手動操作による電源回路開閉手段開閉の煩雑さをなくし、電力の浪費と発光部寿命の短縮を抑える光信号送信機を得ることができる。

【0012】

【発明の実施の形態】本発明の請求項1に記載の発明は、使用中を通して通電され、映像信号入力の有無を検出する映像信号検出回路と、この映像信号検出回路の出力信号により開閉制御される電源回路開閉手段と、この電源回路開閉手段の負荷側に接続され、映像信号入力を所定の基準電圧レベルでクランプする映像信号入力回路と、上記電源回路開閉手段の負荷側に接続され、上記映像信号入力回路の出力を周波数変調する周波数変調回路と、上記電源回路開閉手段の負荷側に接続され、上記周波数変調回路の出力を光信号に変換して投光する光信号送信回路からなる光信号送信機としたものであり、映像信号が入力されたときのみ、電源回路開閉手段が閉となるように自動的に制御されて、映像信号入力回路以降の回路に電源を供給させて動作させることができ、手動操作による電源回路開閉手段開閉の煩雑さをなくし、電力の浪費と発光部寿命の短縮を抑える光信号送信機を実現できるという作用を有する。

【0013】請求項2に記載の発明は、請求項1記載の発明において、映像信号検出回路が、映像信号に含まれた同期信号を抽出する同期信号抽出回路を有し、抽出された同期信号を積分して所定の電圧レベルに達したときに電源回路開閉手段を閉とするように制御し、同期信号が所定の時間抽出されない時に電源回路開閉手段を開とするように制御するものであり、周期や電圧レベルの安定した同期信号を利用して映像信号の有無を検出でき、電源回路開閉手段を確実に開閉制御することができる光信号送信機を実現できるという作用を有する。

【0014】請求項3に記載の発明は、請求項1または2記載の発明において、少なくとも他の電子機器の電源と信号出力が供給されて使用されるものであり、他の電子機器から出力される映像信号を光信号に変換して、さらに別の電子機器へ送信することができるという作用を有する。

【0015】請求項4に記載の発明は、請求項3記載の発明において、映像検出回路により映像信号入力検出されると共に、他の電子機器から出力される開閉制御信号が電源回路開閉手段を閉にする信号の時に電源回路開

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閉手段が閉となるものであり、映像信号が入力されている際、他の電子機器の所定の機能の使用有無によって出力される開閉制御信号で電源回路開閉手段を自動的に開閉制御することができるという作用を有する。

【0016】請求項5に記載の発明は、請求項3または4記載の発明において、電源回路開閉手段の開閉制御信号を信号検出回路の出力信号のみ、信号検出回路の出力信号と他の電子機器から出力される開閉制御信号の両方、または電源回路開閉手段を常時開状態にする信号のいずれかに選択する切換えスイッチを設けたものであり、電源回路開閉手段の開閉制御を映像信号入力の有無のみで行うか、映像信号入力の有無と他の電子機器からの開閉制御信号の両方で行うか、または電源回路開閉手段を常時開にするような用途に応じた選択ができるという作用を有する。

【0017】以下、本発明の実施の形態について、図面を用いて説明する。なお、従来の技術の項で説明した構成と同一構成の部分には同一符号を付して、詳細な説明を省略する。

【0018】（実施の形態1）図1は本発明の第1の実施の形態による光信号送信機のブロック図であり、同図において、1は外部から入力される映像信号を所定の基準電圧レベルにクランプする映像信号入力回路、2は映像信号入力回路1の出力を周波数変調する周波数変調回路、3は周波数変調回路2の出力である変調信号を光信号に変換して投光する光信号送信回路、4は電池などを用いた電源であり、これらは従来の技術の項で説明したものと同様に構成されたものであると共に、それらの動作も同様であるので詳しい説明を省略する。

【0019】そして、21は電源4に接続されて常時電力が供給されている映像信号検出回路で、外部からの映像信号入力の有無のそれぞれに対応した開閉制御信号を出力するものであり、22はリレーなどで構成された電源回路開閉手段で、その一方が上記電源4に接続され、負荷側である他方が上記映像信号入力回路1、周波数変調回路2、および光信号送信回路3のそれぞれに並列に接続されており、上記映像信号検出回路21からの開閉制御信号によって閉となるように制御された時に上記電源4からの電力を上記映像信号入力回路1、周波数変調回路2、および光信号送信回路3へ供給するものである。

【0020】さらに、上記映像信号検出回路21は図2の概略構成図に示すように構成されており、同図において23は入力された映像信号から同期信号を抽出する同期信号抽出回路、24は抽出した同期信号を反転して出力レベルとして電源電圧レベルまたはグラウンドレベルの2値を得る反転バッファ回路、25は反転バッファ回路24の出力を積分するために2個の抵抗26、27および1個のコンデンサ28により構成された積分器である。

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【0021】次に、このような映像信号検出回路21の動作を説明すると、例えば、NTSC方式の映像信号が入力された時、同期信号抽出回路は、映像信号の中に15KHzの一定周期で存在する水平同期信号を抽出するように設定され、反転バッファ回路24が、抽出された同期信号に対応した周期で電源電圧レベルとグランドレベルの2値の矩形波形の信号を出力する。

【0022】そして、この矩形波形の信号を積分器25が積分してコンデンサ28を充電し、その両端の電圧、すなわち積分器25の出力電圧が所定のレベルになった時、電源回路開閉手段22を閉とし、映像信号入力が停止してコンデンサ28の電荷が抵抗27を介して放電され、コンデンサ28の両端の電圧が所定のレベルよりも低下した時、電源回路開閉手段22を開とするような開閉制御信号を出力するものである。

【0023】このように、映像信号入力の有無の検出に一定周期の電圧レベルの安定した同期信号を利用することにより精度の高い有無検出が得られると共に、抽出された同期信号を安定した波形の矩形波に変換することが容易であり、この矩形波の信号によってコンデンサ28を充電し、映像信号入力がない時に放電させる時定数を抵抗26、27およびコンデンサ28の値の選定で設定することにより、映像信号が入力されてから電源回路開閉手段22を閉にするまでの時間、および映像信号入力が停止されてから電源回路開閉手段22を開にするまでの時間を適切に設定することができて、瞬時的なノイズの入力や、また瞬時的な映像信号または同期信号の欠落があっても電源回路開閉手段22を安定して開または閉の状態に保つことができるものである。

【0024】さらに、積分器25の出力側と電源回路開閉手段22の間にバッファ回路（図示せず）を設け、電源回路開閉手段22の開閉制御信号を一層安定したものとすることができ、また電源回路開閉手段22の開閉制御の極性が上記の場合と逆の場合には反転バッファ回路（図示せず）を設けて対応することができるものである。

【0025】以上のように本実施の形態によれば、映像信号が入力された時のみ、電源回路開閉手段22を自動的に閉にして、電力の多くを消費する映像信号入力回路1、周波数変調回路2、および光信号送信回路3に電力が供給され、映像信号入力が停止した時には電源回路開閉手段22を自動的に開にするので、電源回路開閉手段22の手動操作による煩雑さをなくし、電力の浪費とLEDの寿命短縮を抑える光信号送信機を得ることができるものである。

【0026】なお、上記実施の形態では、映像信号を光信号に変換して送信する光信号送信機を説明したが、音声信号、デジタル信号、および、それらの信号を複合した信号を光信号に変換して送信するものとしても、同様な効果を得ることができることは勿論である。

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【0027】（実施の形態2）図3は本発明の第2の実施の形態によるビデオカメラと組み合わされた光信号送信機の概略構成図であり、同図において31は光信号送信機、32は比較的大型のLCD表示部33が本体側面に装着されたビデオカメラであり、ビデオカメラ32側の電源34、映像信号出力部35、およびLCD表示部33の使用・不使用に伴う信号出力部36がそれぞれ光信号送信機31に接続されている。

【0028】そして、光信号送信機31内には映像信号検出回路37からの出力である開閉制御信号およびLCD表示部33の使用・不使用の信号の論理積をとるAND回路38と、その出力側に用途に応じて光信号送信機31の電源回路開閉手段39の制御状態を変更することができるモード切換えスイッチ40が設けられている。

【0029】つぎに、上記のようにビデオカメラ32と組み合わされて構成された光信号送信機31の動作を説明する。

【0030】まず、モード切換えスイッチ40がAモードに設定されている時は、映像信号検出回路37からの開閉制御信号だけがモード切換えスイッチ40を介して電源回路開閉手段39に入力されるようになり、映像信号が入力された時のみ光信号送信機31が動作するものであり、モード切換えスイッチ40がBモードに設定されている時は、映像信号検出回路37からの開閉制御信号およびLCD表示部33の使用・不使用の信号出力部36からの信号の論理積をとるAND回路38の出力がモード切換えスイッチ40を介して電源回路開閉手段39に入力されるようになり、映像信号が入力されると共に、LCD表示部33の不使用時のみAND回路38による論理積出力が電源回路開閉手段39を閉にして光信号送信機31が動作するものであり、モード切換えスイッチ40がCモードに設定されている時は、モード切換えスイッチ40を介した電源回路開閉手段39への入力が常時グランドレベルであり、光信号送信機31に映像信号が入力されても光信号送信機31は動作しないものである。

【0031】以上のように本実施の形態によれば、モード切換えスイッチ40がAモードに設定されている場合は、光信号送信機31に映像信号が入力されると自動的に電源回路開閉手段39が閉となって光信号送信機31で映像信号が光信号に変換されて受信側であるTV受信機（図示せず）へ送信されると共に、必要な場合にはビデオカメラ32に装着されたLCD表示部33でも映像を表示させることができ、モード切換えスイッチ40がBモードに設定されている場合は、光信号送信機31に映像信号が入力されると共に、LCD表示部33の不使用時には自動的に電源回路開閉手段39が閉となって光信号がTV受信機へ送信され、LCD表示部33を使用する時には電源回路開閉手段39が自動的に開となって光信号送信機31による電力の浪費と発光部寿命の短縮

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を抑えるものであり、ビデオカメラ32とTV受信機の間を別のケーブル(図示せず)などで接続して映像信号を送信する場合には、モード切換えスイッチ40をCモードに設定して、光信号送信機31に映像信号が入力されても光信号送信機31を動作させないというように、モード切換えスイッチ40の設定により光信号送信機31の用途に応じた使用法を容易に選択できるものである。

【0032】

【発明の効果】以上のように本発明によれば、映像信号検出回路を除いて、比較的大電力を消費する回路には、映像信号が入力されたときのみ自動的に電力を供給させ、電源回路開閉手段の手動操作による煩雑さをなくし、電力の浪費と発光部寿命の短縮を抑える光信号送信機を実現できるという有利な効果を得ることができる。

【図面の簡単な説明】

【図1】本発明の第1の実施の形態による光信号送信機のブロック図

【図2】同映像信号検出回路の概略構成図

【図3】本発明の第2の実施の形態によるビデオカメラと組み合わされた光信号送信機の概略構成図

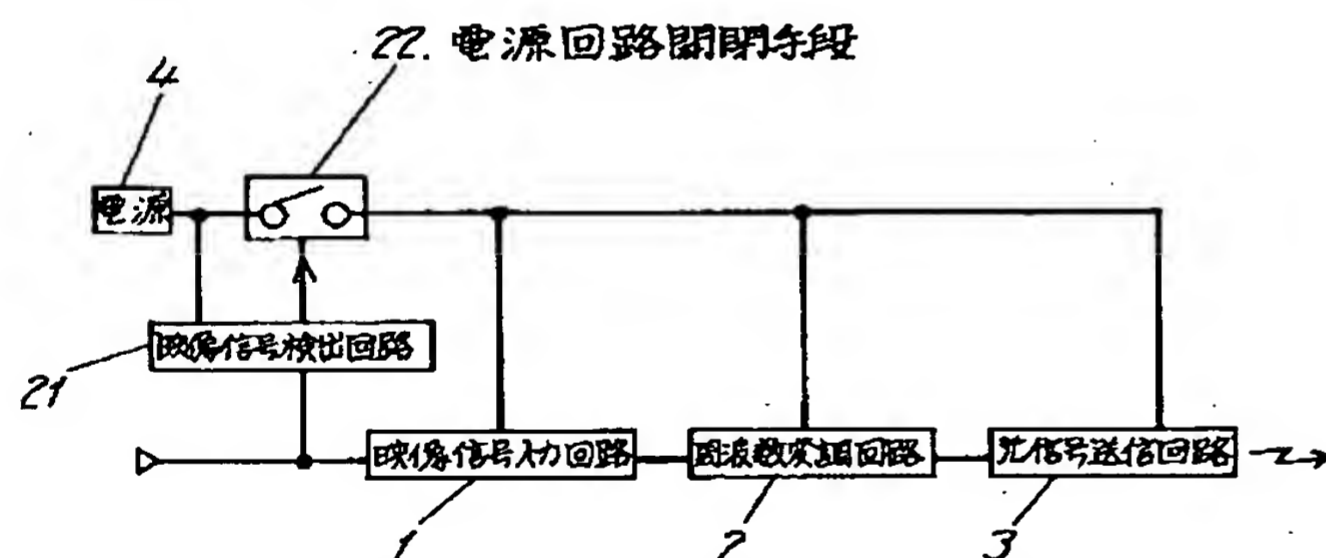
【図4】従来の光信号送信機のブロック図

【図5】同光信号送信回路の回路図

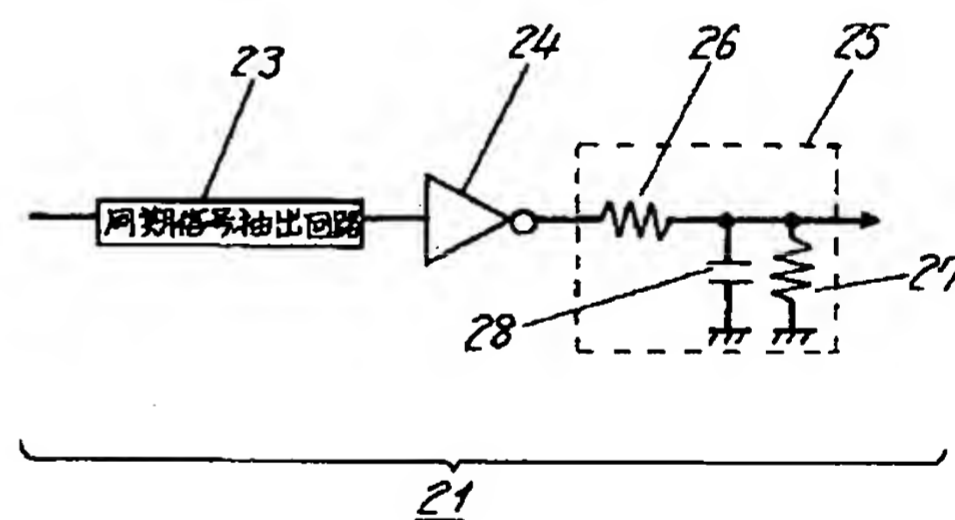
【符号の説明】

- 1 映像信号入力回路
- 2 周波数変調回路
- 3 光信号送信回路
- 4, 34 電源
- 21, 37 映像信号検出回路
- 22, 39 電源回路開閉手段
- 23 同期信号抽出回路
- 24 反転バッファ回路
- 25 積分器
- 26, 27 抵抗
- 28 コンデンサ
- 31 光信号送信機
- 32 ビデオカメラ
- 33 LCD表示部
- 35 映像信号出力部
- 36 信号出力部
- 38 AND回路
- 40 モード切換えスイッチ

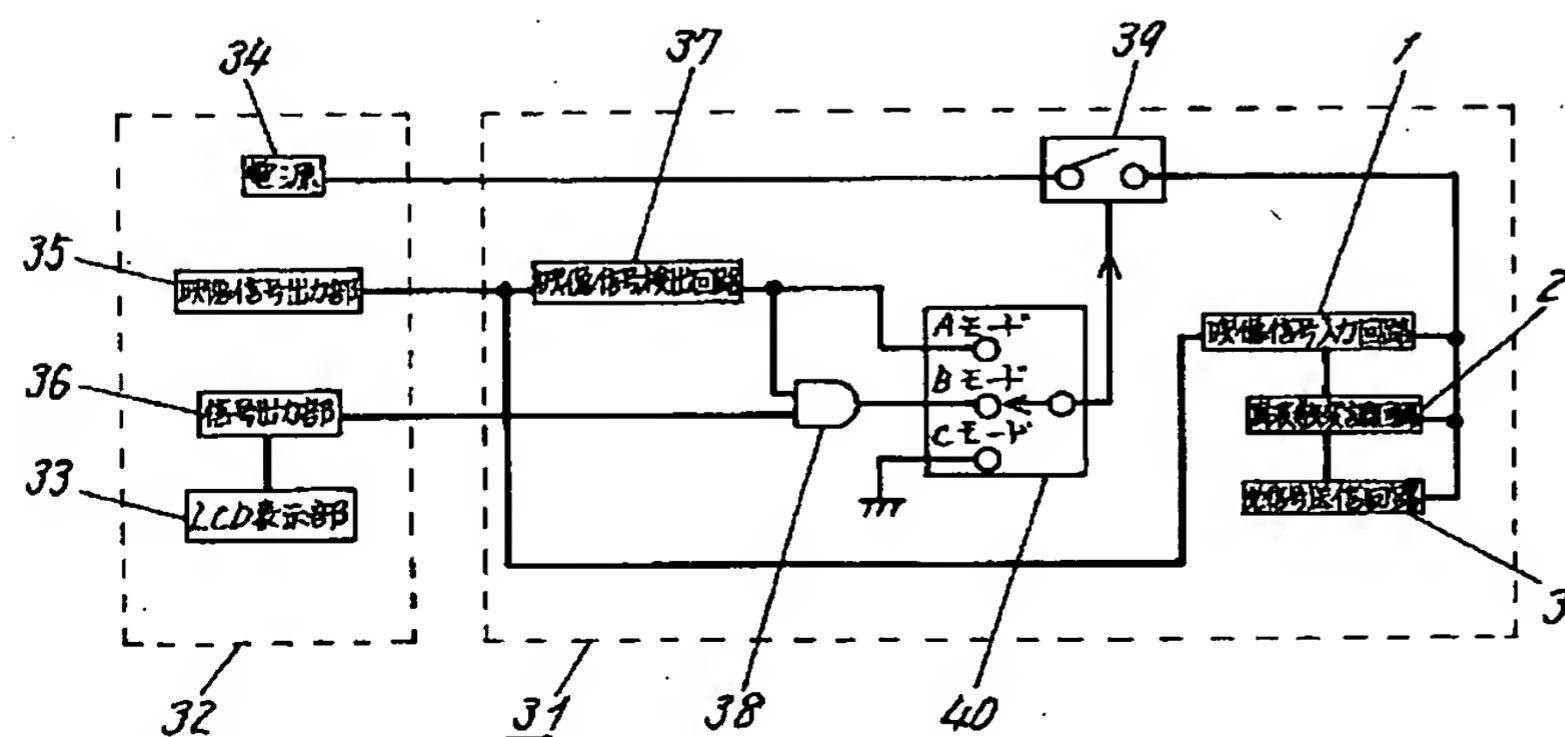
【図1】



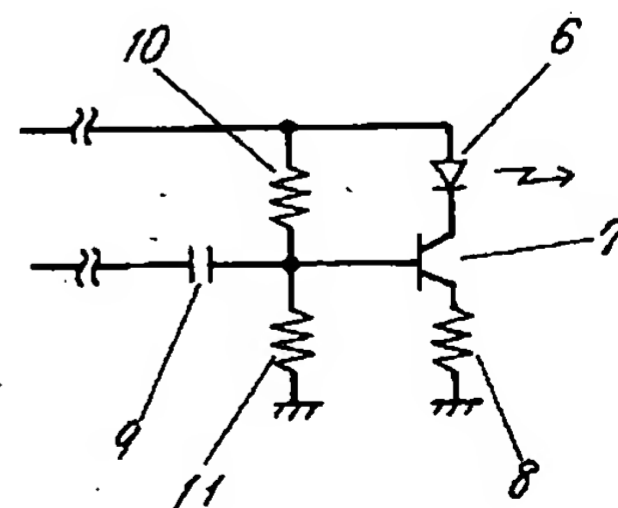
【図2】



【図3】

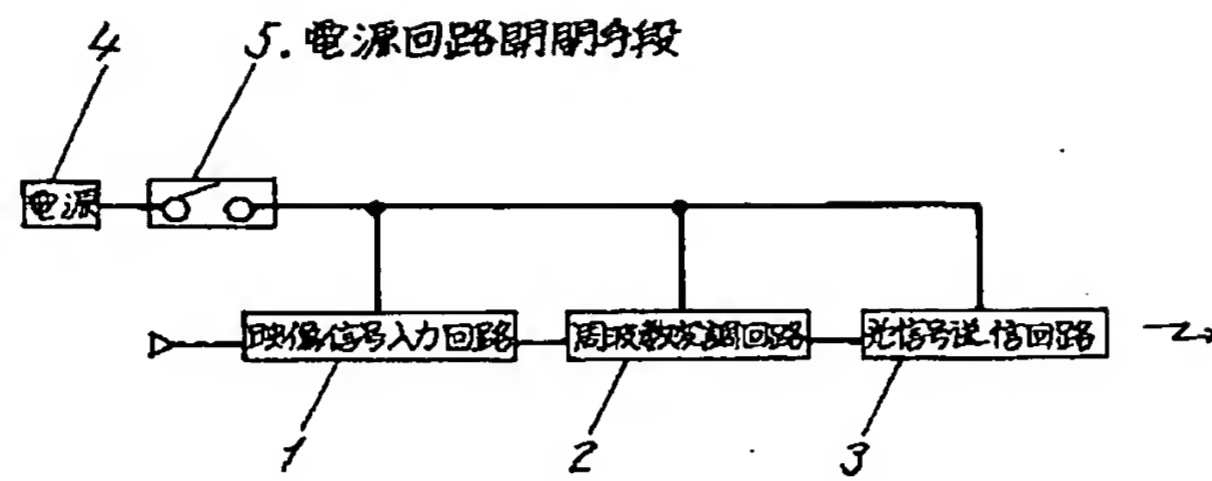


【図5】



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【図4】



フロントページの続き

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